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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,299	03/30/2001	Rahul Magoon	50321-1920	6843

24504 7590 07/28/2005

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EXAMINER	
WILLIAMS, LAWRENCE B	
ART UNIT	PAPER NUMBER
2638	

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/823,299	MAGOON ET AL.	
	Examiner	Art Unit	
	Lawrence B Williams	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 27 June 2005.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-10,12-22 and 24-28 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-10,12-22 and 24-28 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on 01 November 2004 is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

2. The indicated allowability of claim 25-28 is withdrawn in view of the newly discovered reference(s) to Baker et al. (US Patent, 6,606,483 B1), Nash (US Patent 6,317,589 B1). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> ((e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 28 is rejected under 35 U.S.C. 102(e) as being anticipated by Nash (US 6,317,589 B1).

Nash discloses in Fig. 3, a method for obtaining accurate quadrature separation of phase components on a radio frequency carrier that can be mapped on an I-Q plane, comprising: generating a fixed local oscillator frequency (112); splitting the local oscillator frequency into two signals having a predetermined phase difference to produce a first output and a second

output (314), mixing the first output (110) and the second output (308) with a radio frequency test signal to generate an I baseband signal and a Q baseband signal; detecting the phase difference between the 1 baseband signal and the Q baseband signal (320); and adjusting (the phase difference of the first output and/or the second output to produce a desired phase difference between the I baseband signal and the Q baseband signal (col. 4, lines 20-33).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-7, 9- 10, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Havens et al. (US Patent 6,313,680 B1) in view of Nash (US 6,317,589).

(1) With regard to claim 1, Havens et al. discloses in Fig(s). 3, 4, 6 a polyphase filter comprising a first phase splitting filter (Fig. 4, element 302) that produces a first output (Fig. 2, 106), a second phase splitting filter (Fig. 4, element 304) that produces a second output (108), a first variable resistance (Fig. 4, R1) connected across the first output (Fig. 4; col. 3, lines 17-20), and circuitry (402) capable of detecting the phase of the outputs produced by the first and second outputs, and circuitry capable of adjusting the first variable resistance to produce a desired phase difference between the first output and the second output (col. 6, lines 1-27), the circuitry capable of detecting the phase of the outputs including a phase detector which detects phase differences between the I-based band signal and the Q-based band signal and an integrator (Fig.

3, element 408), and the circuitry capable of adjusting the first variable resistance includes a differential amplifier (Fig. 6, element 310) having an input connected to the output of the integrator (Fig. 3, element 408), the differential amplifier producing an output to the first variable resistance.

Havens et al. does not however disclose wherein a local oscillator provides a fixed frequency signal to inputs of the first phase splitting filter and the second phase splitting filter, an RF test signal source provides a test signal which is mixed with the first output and the second output to produce an I-based band signal and a Q-based band signal.

However, Nash discloses in Fig. 3, wherein a local oscillator (112) provides a fixed frequency signal to inputs of the first phase splitting filter (314) and the second phase splitting filter (314), an RF test signal source (102) provides a test signal which is mixed with the first output (110) and the second output (308) to produce an I-based band signal and a Q-based band signal.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Nash with the invention of Havens et al as a method of bringing the in-phase and quadrature signals toward the same strength (abstract).

(2) With regard to claim 2, Havens et al. also discloses wherein the first output and the second output are single-ended outputs (col. 5, lines 29-31).

(3) With regard to claim 3, Havens et al. also discloses in Fig. 6, wherein the first and the second outputs are differential outputs (col. 5, lines 31-35).

(4) With regard to claim 4, Havens et al. also discloses in Fig. 4, the filter comprising a second variable resistance (R2) connected across the second output.

(5) With regard to claim 5, Havens et al. also discloses in Fig. 5, wherein the first variable resistance (Q1) and the second variable resistances (Q2) include transistors.

(6) With regard to claim 6, Havens et al. also discloses wherein the transistors including at least one MOSFET transistor operating in the linear range (col. 5, lines 24-26).

(7) With regard to claim 7, Havens et al. also discloses wherein the first variable resistance and the second variable resistance includes a bipolar differential pair (col. 6, lines 42-51).

(8) With regard to claim 9, claim 9 inherits all limitations of claim 1 above. Furthermore, Havens et al. also discloses in Figs. 3 and 8 wherein the circuitry capable of detecting the phase of the outputs includes a phase detector, an integrator and a differential amplifier (col. 6, lines 1-13; col. 7, lines 28-37).

(9) With regard to claim 10, Havens et al. also discloses wherein the circuitry capable of detecting the phase of the outputs includes a phase detector, an integrator, a differential amplifier, a capacitor and a controller for selectively storing and holding the output of the differential amplifier in the capacitor (col. 5, line 36- col. 6, line 27).

(10) With regard to claim 12, Haven et al. the filter of claim 1, wherein the differential amplifier produces an output to the first variable resistance when a switch is closed, the differential amplifier output being stored in a capacitor that provides the differential amplifier output to the first variable resistance when the switch is open (col. 6, lines 27-42).

7. Claims 13 - 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Havens et al. (US Patent 6,313,680 B1) in view of Nash (US 6,317,589).

(1) With regard to claim 1, Havens et al. discloses in Fig(s). 3, 4, 6 a polyphase filter comprising a first phase splitting filter (Fig. 4, element 302) that produces a first output (Fig. 2, 106), a second phase splitting filter (Fig. 4, element 304) that produces a second output (108), a first variable resistance (Fig. 4, R1) connected across the first output (Fig. 4; col. 3, lines 17-20), and detector (402) that determines the phase of the outputs produced by the first and second outputs, adjusts the first variable resistance to produce a desired phase difference between the first output and the second output (col. 6, lines 1-27), the detector (406) including a phase detector which detects phase differences between the I-based band signal and the Q-based band signal and an integrator (Fig. 3, element 408), and the detector further including a differential amplifier (Fig. 6, element 310) having an input connected to the output of the integrator (Fig. 3, element 408), the differential amplifier producing an output to the first variable resistance.

Havens et al. does not however disclose wherein a local oscillator provides a fixed frequency signal to inputs of the first phase splitting filter and the second phase splitting filter, an RF test signal source provides a test signal which is mixed with the first output and the second output to produce an I-based band signal and a Q-based band signal.

However, Nash discloses in Fig. 3, wherein a local oscillator (112) provides a fixed frequency signal to inputs of the first phase splitting filter (314) and the second phase splitting filter (314), an RF test signal source (102) provides a test signal which is mixed with the first output (110) and the second output (308) to produce an I-based band signal and a Q-based band signal.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Nash with the invention of Havens et al as a method of bringing the in-phase and quadrature signals toward the same strength (abstract).

(2) With regard to claim 14, claim 14 inherits all limitations of claim 13 above. Furthermore, Havens et al. also discloses wherein the first output and the second output are single-ended outputs (col. 5, lines 29-31).

(3) With regard to claim 15, claim 15 inherits all limitations of claim 13 above. Furthermore, Havens et al. also discloses in Fig. 6, wherein the first and the second outputs are differential outputs (col. 5, lines 31-35).

(4) With regard to claim 16, claim 16 inherits all limitations of claim 13 above. Furthermore, Havens et al. also discloses in Fig. 4, the filter comprising a second variable resistance (R2) connected across the second output.

(5) With regard to claim 17, claim 17 inherits all limitations of claim 16 above. Furthermore, Havens et al. also discloses in Fig. 5, wherein the first variable resistance (Q1) and the second variable resistances (Q2) include transistors.

(6) With regard to claim 18, claim 18 inherits all limitations of claim 17 above. Furthermore, Havens et al. also discloses wherein the transistors including at least one MOSFET transistor operating in the linear range (col. 5, lines 24-26).

(7) With regard to claim 19, claim 19 inherits all limitations of claim 16 above. Furthermore, Havens et al. also discloses wherein the first variable resistance and the second variable resistance include a bipolar differential pair (col. 6, lines 42-51).

(8) With regard to claim 20, though Havens et al. does not teach wherein the first variable resistance and the second variable resistance include a digitally switchable resistance pair, this limitation would be merely a design choice to one skilled in the art to incorporate the many advantages of digital technology.

(9) With regard to claim 21, claim 21 inherits all limitations of claim 13 above. Furthermore, Havens et al. also discloses in Figs. 3 and 8 wherein the detector includes a phase detector, an integrator and a differential amplifier (col. 6, lines 1-13; col. 7, lines 28-37).

(10) With regard to claim 22, claim 22 inherits all limitations of claim 13 above. Furthermore, Havens et al. also discloses wherein the detector includes a phase detector, an integrator, a differential amplifier, a capacitor and a controller for selectively storing and holding the output of the differential amplifier in the capacitor (col. 5, line 36- col. 6, line 27).

8. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker et al. (US Patent 6,606,483 B1) in view of Proctor, Jr. et al. (US Patent 5,929,704) and further in view of Havens et al. (US Patent 6,313,680 B1).

(1) With regard to claim 25, Baker et al. discloses in Fig(s) 1, 2 a communication system (Fig. 1, element 100) comprising a transmitter (Fig. 1, element 106) and a receiver (Fig. 1, element 104), the transmitter comprising an input, an analog-to-digital converter (Fig. 2, element 252), a digital signal processor (Fig. 2, element 202), a digital-to-analog converter (Fig. 2, element 204) and an RF signal generator (Fig. 2, elements 220, 221), the transmitter modulating an RF carrier with a signal provided to the transmitter input and transmitting the modulated RF carrier (col. 1, lines 17-24).

Baker et al. is silent as to the make up of the receiver and consequently does not teach the receiver comprising an RF input, a local oscillator, a polyphase filter connected to an output of the local oscillator, the polyphase tilter producing first and second outputs from the local oscillator output, a mixer that combines the RF input with the first and second outputs of the polyphase filter, baseband circuitry, an analog-to-digital converter, and a digital signal processor that demodulates an output of the analog-to-digital converter, and produces a demodulated output, the polyphase filter including a first phase splitting filter that produces the first output, a second phase splitting filter that produces the second output, a first variable resistance connected across the first output, and circuitry capable of detecting the phase of the first and second outputs, and adjusting the first variable resistance to produce a desired phase difference between the first output and the second output.

However, Proctor, Jr. et al. discloses the receiver comprising an RF input, a local oscillator (67), a polyphase filter (60) connected to an output of the local oscillator, the polyphase tilter producing first (62) and second (63) outputs from the local oscillator output, a mixer (50, 70) that combines the RF input with the first and second outputs of the polyphase filter, baseband circuitry (56, 76), an analog-to-digital converter (130, 150), and a digital signal processor (100) that demodulates an output of the analog-to-digital converter, and produces a demodulated output, the polyphase filter including a first phase splitting filter that produces the first output (92, 94), a second phase splitting filter that produces the second output, a first variable resistance connected across the first output, and circuitry capable of detecting the phase of the first and second outputs (80, 90).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Procter, Jr. et al. with the invention of Baker et al. as a method of compensation for the misalignment of RF carriers in the system (col. 2, lines 24-46).

Neither Proctor, Jr. et al. or Baker et al. disclose and adjusting the first variable resistance to produce a desired phase difference between the first output and the second output.

However, Havens et al discloses in Fig. 5, adjusting a first variable resistance to produce a desired phase difference between the first output and the second output.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Havens et al. with the invention of Proctor, Jr. et al. in combination with Baker et al. as a method of controlling the phase difference between quadrature and in-phase components (col. 1, lines 40-54).

(2) With regard to claim 26, Baker et al. also discloses wherein the phase is substantially continuously detected and adjusted in a closed loop manner (abstract).

(3) With regard to claim 27, Baker et al. also discloses wherein the phase is adjusted at predetermined times in an open loop manner (abstract).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claim 8 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Havens et al. (US Patent 6,313,680 B1).

Though Havens et al. does not teach wherein the first variable resistance and the second variable resistance includes a digitally switchable resistance pair, this limitation would be merely a design choice to one skilled in the art to incorporate the many advantages of digital technology.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a.) Mrozek et al. discloses in US Patent 6,707,863 B1 Baseband Signal Carrier Recovery of a Suppressed Carrier Modulated Signal.

b.) Greeff et al discloses in US Patent 6,603,391 B1 Phase Shifters, Interrogators, Methods of Shifting a Phase Angle of a Signal and Method of Operating an Interrogator.

c.) Ripley et al. discloses in US Patent 5,870,670 Integrated Image Reject Mixer.

d.) Bonds discloses in US Patent 6,384,681 B1 Swept Performance Monitor For Measuring and Correcting RF Power Amplifier Distortion.

e.) Mucenieks et al. discloses in US Patent 6,407,635 B2 Carrier Blanking Mechanism For Sweeping Detector Used to Measure and Correct RF Power Amplifier Distortion.

f.) Bijker et al. discloses in US Patent 5,341,107 FM Quadrature Demodulator with Two Phase Comparison Circuits.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence B Williams whose telephone number is 571-272-3037. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence B. Williams

lbw
July 26, 2005

EMMANUEL BAYARD
PRIMARY EXAMINER